Meteorological Algorithm Output

An **algorithm product** is an overlay, special icon on an image, graph, graphic, table entry, or other information derived from meteorological algorithms displayed in RADS. A product may show the projected track of a storm, indicate the position of a possible tornado or other event, or give information about storm trends. These products are generated by the NSSL meteorological algorithms that ingest Doppler radar and associated data and create product information about mesocyclones, tornadic circulations, hail, and storm cells in general. This product information is converted into a special format so that RADS may display them when requested.

Output from NSSL meteorological algorithms may be viewed in three different ways, depending upon the particular algorithm, as listed below.

1. *NSSL meteorological algorithm products may be displayed graphically*, as special images, graphics, or as product overlays on images. Customized icons for each type of NSSL algorithm output are displayed on high-resolution radar images. See Chapter 3 for more information on product overlays and image windows.

   Special windows and graphics that display algorithm output information accessed from the Control Panel are covered in this chapter, including the VWP (Velocity Wind Profile) and VWP Hodograph windows.

2. *NSSL meteorological algorithm products may be displayed in tabular form*, by pressing one of the Output Table buttons on the RADS control panel (**Cell Tbl**, **Meso Tbl**, **Torn Tbl**) for NSSL meteorological algorithm output information. When this option is chosen, a table providing information on either storm cells, mesocyclones, or tornadoes for the current volume scan are displayed in order of severity, with the most severe event listed at the top of the table. Attributes are also color-coded for severity or for classification purposes.

3. *NSSL meteorological algorithm products may be displayed in individual trend graphics, sets of related individual trend graphics, or in time-height trend graphics*. These trends show severe meteorological event information as functions of time. NSSL algorithm output provides information for these trends.

See Chapter 4 for more detailed information on meteorological algorithm output of all three types.

VELOCITY WIND PROFILE INFORMATION

VWP: Velocity Wind Profile Menu

The Control Panel's Velocity Wind Profile button, when activated (depressed), displays a pop-up menu for the velocity wind profile image and/or hodograph for the current volume scan and sweep (Figure 2.15). This information is produced by the WSR-88D Velocity Azimuth Display (VAD) algorithm.

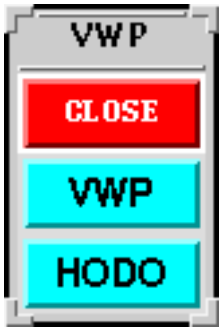

Figure 2.15: The VWP Pop-up Menu.

VWP: Velocity Wind Profile Window and Graphic

When you activate the VWP window a graphic showing wind speeds and directions above the radar are displayed as a function of time (Figure 2.16). All quantities are calculated by the VAD algorithm. The color of the wind barbs are shown in two ways- either by the magnitude of the wind speed or the magnitude of the Root Mean Squared Errors (RMS). To toggle between WIND SPEED and RMS modes, click on the graphic anywhere with the <left-mouse> button.

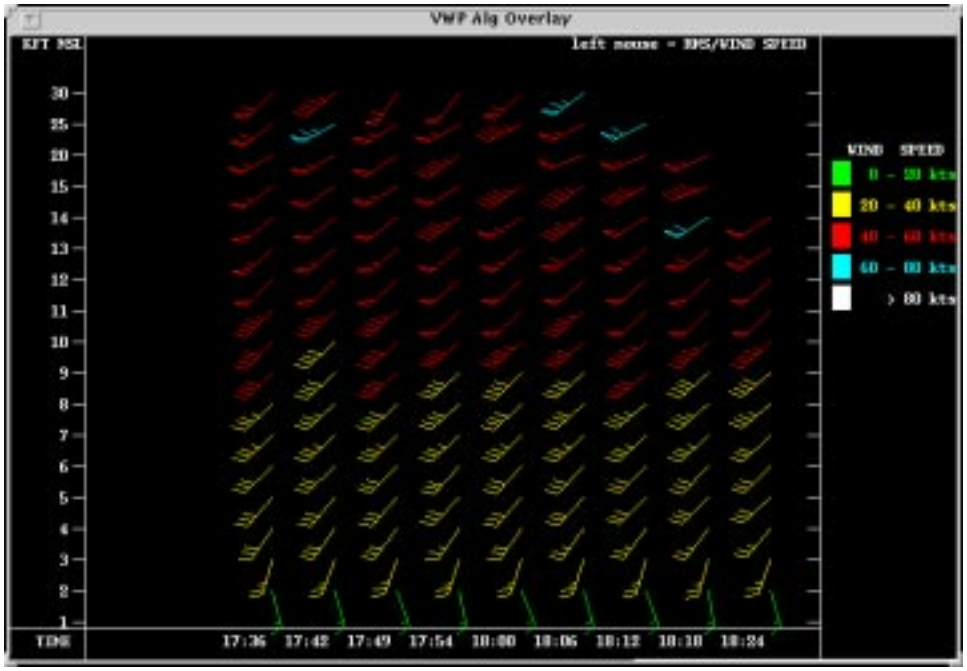

Figure 2.16: Example Velocity Wind Profile window. Wind profiles are displayed in kilofeet above the radar as functions of time. The legend on the right gives color coding information for each barb vector.

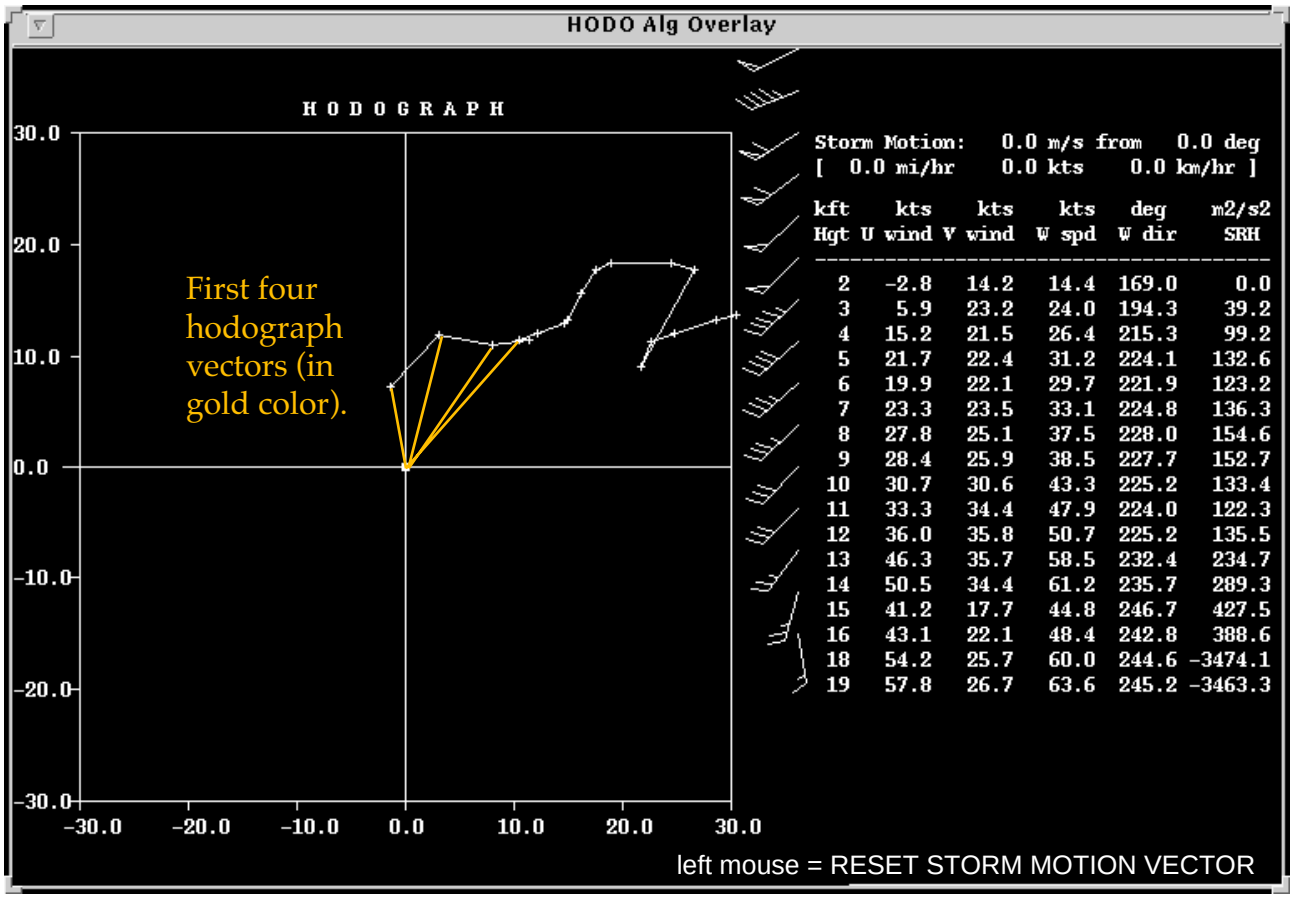

Figure 2.17: The Velocity Wind Profile Hodograph Window.

HODO HODO: Graphic Window

When this window is activated, the VWP algorithm output for a two-dimensional hodograph displaying wind speed and direction is shown. (Figure 2.17) A vertical wind profile for the current volume scan is also displayed, as well as an optional Storm Motion vector with associated storm relative helicity, which may be specified by the user.

The fields specified in the hodograph are:

`kft Hgt: ...`	Height, always in thousands of feet.
`U wind ....`	U component of the wind vector in current units
`V wind ...`	V component of the wind vector in current units
`W spd ....`	Wind speed in current units (knots or $\frac{m}{sec}$)
`W dir ....`	Wind direction in degrees
`SRH .....`	Storm Relative Helicity, always in $\frac{m^2}{sec^2}$

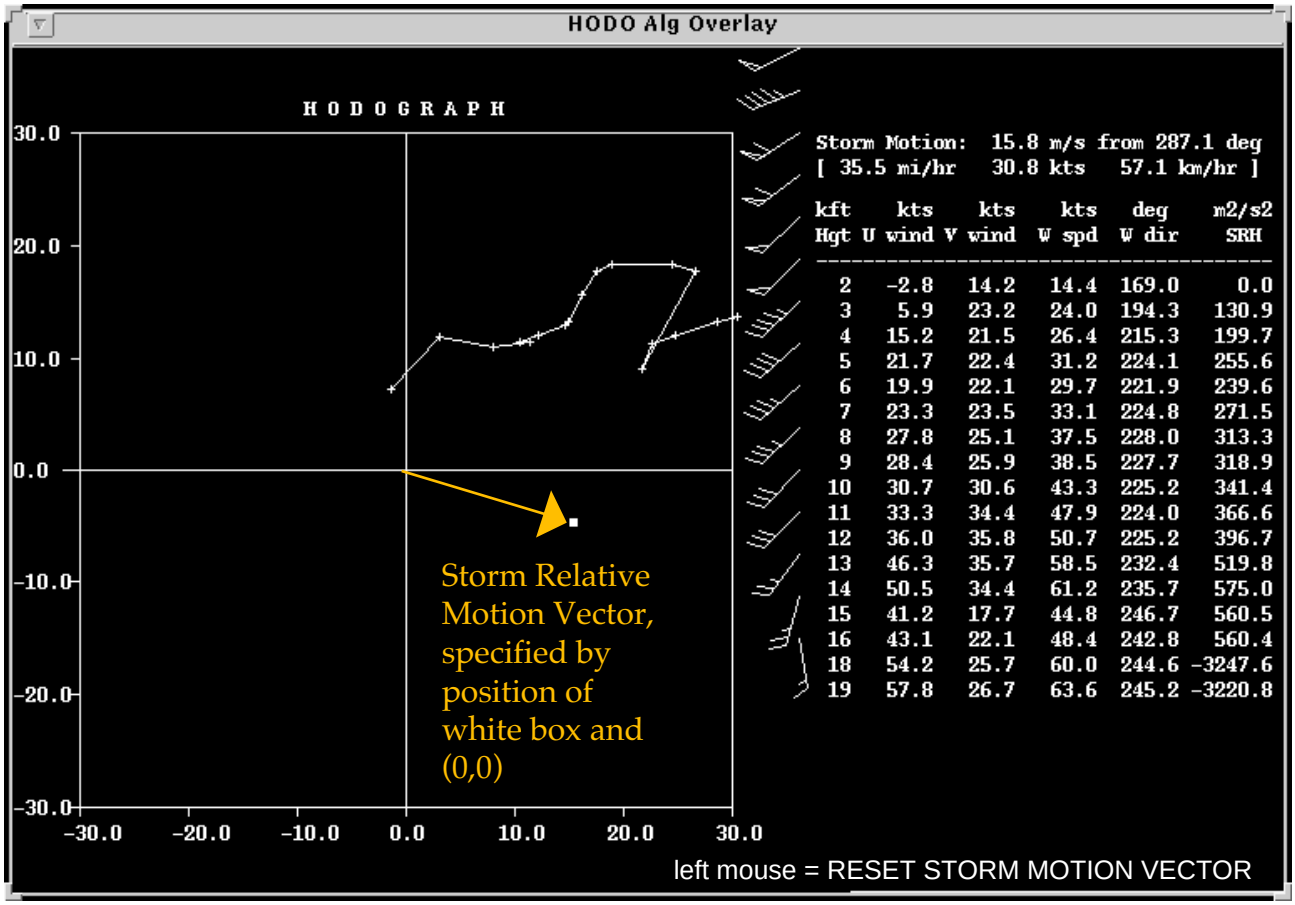

Figure 2.18: The Velocity Wind Profile hodograph graphic with storm relative motion vector specified by the user.

Changing the Storm Motion Vector in the Hodograph Graphic

You may quickly and easily change the storm motion vector specified in the hodograph. In Figure 2.18, the storm motion vector has been moved from the default coordinates of (0,0), to 15.8 m/s from the direction of 287.1 degrees. To change the storm motion vector to any coordinate on the hodograph, simply click on the new desired coordinate. A white square denoting the new position of the tip of the storm motion vector will appear.

To reset the Storm Motion Vector to (0,0), click once on the origin with <left-mouse>.